Section 1004 and 1021. Disclosure of this information is required. Failure to do so may result in a civil penalty up to $25,000 for each day the failure continues, a fine up to $50,000 and imprisonment up to 5 years. This form has been approved by the Forms Management Center.

IESDA INCIDENT 930214

Illinois Environmental Protection Agency
LEAKING UNDERGROUND STORAGE TANK PROGRAM
CORRECTIVE ACTION FORM

Site # (IEPA Generator number): 0430305016
leave blank if unknown

ESDA #: 930214
Facility Name: ARROW GEAR COMPANY
Mailing address: 2301 Curtiss Street
City: Downers Grove Zip Code: 60515
County: DuPage

WILL THE OWNER/OPERATOR SEEK REIMBURSEMENT FOR CORRECTIVE ACTION COSTS FROM THE UNDERGROUND STORAGE TANK FUND? (CHECK ONE): YES ___ NO XX

OWNER
Name: ARROW GEAR COMPANY
Address: 2301 Curtiss Street
Downers Grove, IL 60515

Contact Name: James E. Pielsticker
Phone: (708) 969-7640

OPERATOR *(if different from owner)*
Name: SAME
Address:

Contact Name:
Phone:

CONSULTANT
Firm: Adept Environmental Solutions, Inc.
Address: 1100 South Waiola Avenue
La Grange, IL 60525

Contact Name: Dana Rose
Phone: (708) 352-9322

SURVEYOR
Firm:
Address:

Contact Name:
Phone:

A. GROUNDWATER INVESTIGATION PLAN

The groundwater investigation plan shall contain:

1. The physical and chemical characteristics of the substance stored in the UST System(s), including its toxicity, persistence in the soil and groundwater, and potential for migration off the site
2. Characterization of the geology beneath the site; and
3. The hydrogeologic characteristics of the site such as porosity, permeability, and hydraulic conductivities.
4. Monitoring Well Information

   The following information must be submitted:

   a. Drilling methods that will be used and why these methods were selected.

   b. Discussion of the basis for determining the location and minimum number of monitoring wells to be placed at the site.

c. Discussion of the approach that will be taken to determine whether additional monitoring wells will be required.

d. Activities undertaken which will prevent cross- contamination during well installation.

e. Discussion of monitoring well installation procedures and monitoring well construction.

f. Discussion of monitoring well development procedures.

g. Discussion of monitoring well sampling protocol.

h. The submission of monitoring well completion reports and boring logs.

5. Groundwater Data

The following information must be submitted:

a. Site characterization map showing nearby residences, public water wells, private water wells, water ways, etc.

b. Groundwater contour maps showing groundwater flow direction.

c. Stratigraphically correlated hydrogeologic cross section(s) or three dimensional diagram(s) developed from borings at the site which adequately define the spatial relationships between subsurface geology.

d. Groundwater contamination plume depicting the extent of contamination exceeding the cleanup objectives.

e. Evaluation of the potential impact of the contamination to effect on or off-site water wells, residences, buildings, etc.

f. A discussion of how off-site groundwater contamination will be investigated.

g. The proximity, quality, and current uses of nearby surface water and groundwater

h. The effects of residual contamination on nearby surface water and groundwater

B. **TYPE OF REMEDIATION SELECTED** *(please check those appropriate)*

SOIL:

- [X] Excavation *(alone)*
- [ ] Excavation *(along with another remediation system, if so indicate which)*
- [ ] Bioremediation
- [ ] Thermal Treatment
- [ ] Land Treatment
- [ ] Vacuum Extraction
- [ ] Vitrification
- [ ] Soil Washing
- [ ] Other *(specify)*:

GROUNDWATER:

- ☐ Pump and treat
- ☐ Diffused air treatment
- ☐ Air stripper
- ☐ In-line filters
- ☐ Carbon adsorption
- ☐ Other *(specify)*:
- ☐ Bioremediation
- ☐ Hydraulic barriers
- ☐ Drains
- ☐ Other *(specify)*:

C. REMEDIATION INFORMATION

The corrective action shall contain, at a minimum:

1. Facility Information:

   a. The physical and chemical characteristics of the substance, including its toxicity, persistence and potential for migration.

   b. The hydrogeologic characteristics of the facility and surrounding area, if not included with a groundwater investigation.

   c. The proximity, quality and current uses of nearby surface and groundwater

   d. The potential effects of residual contamination on nearby surface water and groundwater

   e. Provide a map or plan sheet showing the outline of the facility (include all essential dimensions and legal boundaries), the location of all storage tanks, process buildings, transfer facilities, loading and unloading area, access roads, storm, sanitary, and process sewage systems, monitoring and injection wells, etc.

   f. Provide process flow diagrams or schematic drawing showing flow in soil or groundwater from the time of entry to final destination. Show residual, recycle streams, sample points, process monitoring devices, etc.

   g. Describe the intended operation of the storage or treatment units managed at the site:

      i. type of operation
      ii. days and hours of operation
      iii. numbers and duties of employees
      iv. logistics - describe how wastes are loaded, unloaded and moved within the site; provide the estimate traffic volume, number and types of transporting vehicles and other equipment (i.e. fork lifts, loaders, etc.) and identify any safety procedures used to prevent accident during waste transfer operations and remediation activities.
      v. equipment utilized - identify each item's function, physical description, capacity, and model number; number of units used in the operation of each storage or treatment process
      vi. methods of dust or odor control
      vii. daily clean-up procedures to be used
      viii. security systems to prevent unauthorized access
      ix. frequency of process measures in the treatment area or system

2. Design Information of any treatment units used for remediation

Provide the following:

a. Provide plan views, cross-sections and specifications of the treatment areas and treatment equipment, including process flow diagram, containment systems, drainage systems, run-off and run-on control structures, operational controls and any other design information that demonstrates that the proposed remediation will achieve the cleanup goal. Provide a mass balance throughout the treatment process. State the objective/goal for each treatment process and performance criteria. Express the design capacity of the system, include maximum, minimum and expected flow rates in gallon/hour, pounds/hour or tons/hour. For batch treatment processes, indicate the frequency with which the batches will be treated.

i. If a **SOIL VAPOR EXTRACTION SYSTEM** will be used include the following:

A. Description of site geology and site hydrogeology, including stratigraphic cross-sections from on-site boring and soil classification.

B. Chemical composition of the contaminant including an evaluation of the effectiveness of the system based on the compounds present and their respective concentrations.

C. Site map to scale including:

a. outline of the facility
b. location of UST System(s)
c. location of roads and sewers adjacent to property
d. location of monitoring wells and soil borings
e. physical boundary of contamination
f. identification of adjacent property

D. Design criteria shown on site map to scale:

a. number of wells (extraction and injection points)
b. well (extraction and injection) point spacing with radius of influence in both the vertical and horizontal directions
c. well (extraction and injection) point locations
d. well (extraction and injection) construction details
e. extraction or injection system sizing
f. cross-sections showing the above information

E. Vapor flow rates through the unsaturated zone.

F. Flow path of carrier vapor in relation to the location of the contamination.

G. Mass balance removal rates and time required to achieve the clean-up objectives.

H. Evaluation of the effectiveness proposed system the facilities soil types.

I. Design and specification details of the treatment system for extracted vapors.

J. Description of sampling and analysis plan to monitor the effectiveness of the system.

K. Description of groundwater monitoring program. A minimum of one upgradient monitoring well and three downgradient monitoring wells from the area of known contamination will be required.

L. Description of the operation and maintenance of the system.

M. Detailed, itemized, cost estimates for the design, installation, capital, maintenance and closure of the proposed system.

N. Engineering and cost evaluation of the proposed techniques to conventional techniques (i.e. excavation and disposal off-site of contaminated soil).

O. Detailed plan for final site confirmation sampling to end the remediation.

P. Completion Information:

The completion information must include:

a. Steps necessary for the final shut down of the unit at the end of its intended operational life,

b. Steps necessary to prevent damage to the environment during temporary shut down of the unit without initiating final shut down.

c. A description of the steps necessary to decontaminate equipment (including clean up equipment) during final shut down

d. Constituent levels, sampling, and analytical requirements that demonstrate the unit has been restored to background levels (also include appropriate detection limits).

e. How areas around the unit will be checked for contamination from spills, etc. and if found how, and to what extent will any contaminated areas be remediated.

f. The maximum amount of waste in storage at any time, if necessary.

g. How all facility and unit equipment and structure will be cleaned, if necessary.

h. How any clean up equipment or waste generated from the cleaning process will be managed.

ii. If a **THERMAL TREATMENT** unit will be used include the following information:

A. Type of equipment and model number,

B. Maximum amount of soil to be treated (volume/hour),

C. Estimated daily amount of soil to be treated,

D. Operating temperature,

E. Residence times of soil, gases, and ash,

F. Description of pollution control devices,

G. Information on the management of soil prior to treatment,

H. Design specifications.

a. plan view, elevation view, isometric view of treatment equipment and pollution control equipment,
b. schematic diagram of the unit and pollution control equipment,

c. the location of all monitors must be indicated on the above drawings,
d. minimum, maximum, and nominal operating conditions: CO levels, HCl levels, temperature, combustion gas flow rates, etc.,
e. detailed description of how the system interlocks and emergency soil feed cut-off system work.

iii. If a **LAND TREATMENT** unit will be used include the following information:

A. Provide a topographic map (or maps of the area which contains the site or facility, drawn to a scale of one inch equal to no more than 200 feet, containing 5-foot contour intervals where the relief exceeds 20 feet, and 2-foot contour intervals where the relief is 20 feet or less, and reference to a United States Geological Survey datum.

B. Provide a separate map or plan sheet, using the same scale as the topographic map, showing the outline of the facility (include all essential dimensions and legal boundaries), the location of all storage tanks, process building, transfer facilities, loading and unloading area, access roads, storm, sanitary and process sewer systems, monitoring and injection wells.

C. Describe the intended operation of the unit:

a. type of operation - i.e., continuous or batch;

b. days and hours of operation of the facility (include both "business" and operating hours);

c. numbers and duties of employees at the facility - include person(s) directly responsible for operation of the unit and the facility;

d. logistics - describe how wastes are loaded, unloaded and moved within the facility and unit. Provide the estimated traffic volume for this activity, number and type of transporting vehicles and other equipment (i.e. fork lifts, loaders, etc.) and identify any safety procedures used to prevent accidents during waste transfer operations;

e. equipment utilized - identify each item's function, physical description, capacity, make and model number and the number of each item used in the operation of each storage or treatment unit;

f. methods to control dust or odor;

g. daily cleanup procedures to be used;

h. security system to prevent unauthorized access to the storage or treatment units; and

i. frequency of disking, etc. of the soil in the treatment area.

D. Design Information:

a. Provide plan view and cross-sections of the treatment areas, storage areas (for incoming waste and treated waste), containment systems, drainage systems, run-on and run-off control structures.

b. Provide design capacity information (maximum amount of treatment and storage capacity).

E. Pre-Construction Information:

Provide a sampling and analysis plan to characterize the background level of the constituents of concern in the treatment, storage and run-on/run-off contour areas prior to beginning treatment.

F. Run-on/Run-off:

a. Provide design information (drawings, calculations, etc.) on the capacity of the system to contain run-off from any storage areas (treated and untreated) and the treatment system.

b. Provide design information, drawing, etc. on the run- on control system.

G. Operation:

a. Describe frequency and amount of waste receipt.

b. Describe sampling plan for incoming waste and waste in treatment area. (include frequency, location parameters, etc.)

H. Completion Information:

The completion information must include as a minimum:

a. Steps necessary for the final shut down of the unit at the end of its intended operational life,

b. Steps necessary to prevent damage to the environment during temporary suspension of waste acceptance and operation of the system during suspension of waste acceptance at the units without initiating final shut down.

c. A description of the steps necessary to decontaminate equipment (including clean up equipment) during final shut down.

d. Constituent levels, sampling, and analytical requirements that demonstrate the unit(s) have been restored to background levels (also include appropriate detection limits).

e. How areas around the unit will be checked for contamination from spills, etc. and if found how, and to what extent will any contaminated areas be remediated.

f. The maximum amount of waste in storage at any time.

g. How all facility and unit equipment and structure will be cleaned, if necessary.

h. How any clean up equipment or waste generated from the cleaning process will be managed.

I. Groundwater Monitoring:

If necessary, a groundwater monitoring system must consist of an adequate number of monitoring wells to determine gradient flow direction and properly located to detect a release from an Underground Storage Tank, as defined in 35 Ill. Adm. Code, Subtitle G, Section 731.112.

The proposed groundwater monitoring system should be described and located on maps and cross-sections. The frequency of monitoring and parameters to be analyzed for should be described.

J. Vadose Zone Monitoring:

If necessary a vadose zone monitoring system consisting of a lysimeter on each side of the treatment unit shall be installed to determine any impact from the unit.

The proposed vadose zone monitoring system should be described and located on maps and cross-sections. The frequency of monitoring and parameters to be analyzed for should be described.

iv. If a **GROUNDWATER RECOVERY SYSTEM** will be used, include the following information:

A. Geologic and hydrogeologic conditions (i.e. hydraulic conductivity - field determined thru slug or pump tests, grain size distribution, porosity, hydraulic gradient, stratigraphy, etc.);

B. Depth to the top of fluids (water and hydrocarbon);

C. Identification of water bearing stratum beneath the site;

D. Direction of groundwater flow;

E. Product characteristics (i.e. density, viscosity, solubity, henry's law constant, etc.);

F. Estimated range of fluid level fluctuation during recovery operation, if applicable;

G. Aerial extent of floating and dissolved product;

H. Minimum and maximum pumping rates of the designed system;

I. Groundwater monitoring plan to monitor water quality downgradient of the recovery system to determine effective of the corrective action;

J. Sample ports prior to and immediately after the treatment unit to determine when the treatment system can be shut down;

K. For Recovery Trenches the following additional items must be provided:

a. Provide a description of how the bottom depths of the trenches was chosen;
b. Trench design details must include:
   i. open trench or gravel filled,
   ii. trench slope,
   iii. trench sump depth
   iv. trench pumps - hydrocarbon and explosion resistant,
   v. construction material, screen size (if applicable),
   vi. estimate of amount of water to be discharged and the area of influence from the trench (provide all calculations and equations used),
   vii. effects of free product,
   viii. location of flow meters.

L. For recovery wells the following additional items must be addressed:

i. calculations of well spacing and expected pumping rates (provide equations and calculations used),
ii. location of the top of the screen in relation to the depth of groundwater and product,
iii. flow meters for each pumping well,
iv. types of pumps - vacuum lift, etc.,
v. number of pumps - one or two pump recovery.

b. Identify the material for construction for the various units i.e., tanks: steel, concrete, fiberglass, etc.; drums: steel, plastic, fiber, etc., piping: steel, plastic, fiberglass, fiber, etc.

c. For tank design describe the type and construction of tanks (e.g., open top, floating roof, pressure vessel) and provide a diagram that includes the following items:

i. Diameter and height — Inside diameter (ID) and either outside diameter (OD) or shell thickness should be given in feet and inches.

ii. Capacity — The storage capacity in gallons. Allowance should be provided for freeboard.

iii. Structure — Describe tank supports and other tank appurtenances, such as freeboard, ladder, cages, vents, and platforms etc.

iv. Connections — identify piping and instrumentation including level gauges and controllers, pressure and temperature gauges and controllers, and types of fittings, such as flanges, outlets, spigots, nozzles, etc. Provide a piping drawing which includes pipe locations in plan view, sizes, elevation, typical details, pipe materials and joint types.

v. Feed system — material feed cut-off, by-pass systems high liquid level alarms and pressure control.

vi. Design code — indicate the design standard used and its date or edition numbers.

vii. Provide a written assessment of the structural integrity and suitability of each tank system for handling soil or groundwater. At a minimum the assessment must include the results of a leak test or a tank integrity examination.

d. For container design indicate capacity and demonstrate compliance with Code of Federal Regulations, Title 49, Transportation, Part 17 — Shipping Container Specifications and NFPA 30, when applicable.

3. Operation Information

Provide the following:

A. Describe frequency and amount of waste to be treated

B. Describe sampling plan for in-coming or in-situ waste to be treated by the proposed remediation process. This should include sampling prior to starting the treatment system, sampling to monitor the effectiveness of the treatment system and sampling to confirm that the system has achieved its goal.

C. Maintenance Schedule

4. Completion Information

The completion information shall include, at a minimum:

a. Steps necessary for the final closure of the site at the end of its intended operating life.

b. Steps necessary to prevent damage to the environment during temporary shut down of the treatment system.

c. A description of the steps necessary to decontaminate equipment (including cleaning equipment) during closure activities.

d. Constituent levels, sampling and analytical requirements that demonstrate the facility has been restored to background or clean-up objective levels (also include appropriate detection limits).

e. How areas around the facility will be checked for contamination from spills during remediation, etc.; and, if contamination is found how and to what extent will any contaminated areas be remediated.

f. The maximum amount of waste in storage at any time.

g. How the maximum expected inventory of waste in storage will be disposed.

h. How all equipment and structures will be cleaned, if necessary

i. How any cleanup equipment or waste generated from the cleaning process will be managed.

5. Groundwater Monitoring

If necessary, a groundwater monitoring system must consist of an adequate number of monitoring wells to determine gradient flow direction and properly located to detect a release from an Underground Storage Tank, as defined in 35 Ill. Adm. Code, Subtitle G, Section 731.112.

The proposed groundwater monitoring system should be described and located on maps. The frequency of monitoring and parameters to be analyzed should be described.

6. Cost Estimates For Alternative Soil Remediation Technologies

For sites seeking cost reimbursement, provide the following:

A detailed, itemized cost estimate of the proposed corrective action. This cost estimate must include all costs from the design stage to the closure stage of the proposed remediation. Also, a detail, itemized cost estimate for a conventional technology (i.e. excavate and haul to landfill, etc.) must be provided for comparison to the alternate technology.

7. Corrective Action Completion Report

After completion of the work the Owner/Operator must submit a Corrective Action Completion Report demonstrating that the clean up has been completed as provided in the Corrective Action Form, has met the Agency's established clean up objectives, and was conducted in accordance with all applicable Rules and Regulations. This report must also include the attached certification form from a Register Professional Engineer of Illinois.

NOTE: Additional pages, maps and drawings should be added to this proposal, as needed.